



Province of the
EASTERN CAPE
EDUCATION

**NATIONAL
SENIOR CERTIFICATE**

GRADE 11

NOVEMBER 2016

**LIFE SCIENCES P2
MEMORANDUM**

MARKS: 150

This question paper consists of 8 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES 2016

1. **If more information than marks allocated is given.**
Stop marking when maximum marks is reached and put a wavy line and 'max' in the right-hand margin.
2. **If, for example, three reasons are required and five are given.**
Mark the first three irrespective of whether all or some are correct/incorrect.
3. **If whole process is given when only part of it is required.**
Read all and credit relevant part.
4. **If comparisons are asked for and descriptions are given.**
Accept if differences/similarities are clear.
5. **If tabulation is required but paragraphs are given.**
Candidates will lose marks for not tabulating.
6. **If diagrams are given with annotations when descriptions are required.**
Candidates will lose marks.
7. **If flow charts are given instead of descriptions.**
Candidates will lose marks.
8. **If sequence is muddled and links do not make sense.**
Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links becomes correct again, resume credit.
9. **Non-recognised abbreviations**
Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of answer if correct.
10. **Wrong numbering**
If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.
11. **If language used changes the intended meaning**
Do not accept.
12. **Spelling errors**
If recognisable accept provided it does not mean something else in Life Sciences or if it is out of context.
13. **If common names given in terminology**
Accept provided it was accepted at the memo discussion meeting.

14. **If only letter is asked for and only name is given (and vice versa)**
Do not credit.
15. **If units are not given in measurements**
Candidates will lose marks. Memorandum will allocate marks for units separately.
16. **Be sensitive to the sense of an answer, which may be stated in a different way.**
17. **Caption**
All illustrations (diagrams, graphs, tables, etc.) must have a caption.
18. **Code-switching of official languages (terms and concepts)**
A single word or two that appears in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited, if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.
19. **Changes to the memorandum**
No changes must be made to the marking memoranda without consulting the provincial internal moderator.

SECTION A

QUESTION 1

- | | | | | |
|-----|--------|---------------------------|----------|------|
| 1.1 | 1.1.1 | C ✓✓ | | |
| | 1.1.2 | B ✓✓ | | |
| | 1.1.3 | C ✓✓ | | |
| | 1.1.4 | D ✓✓ | | |
| | 1.1.5 | C ✓✓ | | |
| | 1.1.6 | B ✓✓ | | |
| | 1.1.7 | A ✓✓ | | |
| | 1.1.8 | C ✓✓ | | |
| | 1.1.9 | C ✓✓ | | |
| | 1.1.10 | A ✓✓ | (10 × 2) | (20) |
| 1.2 | 1.2.1 | Bacteriophage ✓ | | |
| | 1.2.2 | Flagella/flagellum ✓ | | |
| | 1.2.3 | Monocotyledons/monocots ✓ | | |
| | 1.2.4 | Seed ✓ | | |
| | 1.2.5 | Cephalisation ✓ | | |
| | 1.2.6 | Haemocoel ✓ | | |
| | 1.2.7 | Hoodia ✓ | | |
| | 1.2.8 | Monoculture ✓ | | |
| | 1.2.9 | Notochord ✓ | | (9) |
| 1.3 | 1.3.1 | B only ✓✓ | | |
| | 1.3.2 | None ✓✓ | | |
| | 1.3.3 | A only ✓✓ | | |
| | 1.3.4 | A only ✓✓ | | |
| | 1.3.5 | B only ✓✓ | | |
| | 1.3.6 | B only ✓✓ | (6 × 2) | (12) |

- 1.4 1.4.1 (a) Vascular tissue ✓/Conducting tissue/Xylem and Phloem
 (b) Seeds ✓
 (c) Fruit ✓/Flowers (3)
- 1.4.2 Bryophytes ✓ (1)
- 1.4.3 Possess vascular/conducting tissue ✓ to push water up to tips of tall plants /for strengthening/for support ✓ (2)
- 1.4.4 Gymnosperm seeds are naked ✓/exposed on a cone
 Angiosperm seeds are enclosed ✓ in an ovary (2)
- 1.4.5 Spermatophytes/Spermatophyta ✓ (1)

TOTAL SECTION A: 50

SECTION B

QUESTION 2

- 2.1 2.1.1 Sugar water helps mould grow more than other factors on bread. ✓✓
OR
 Other factors (tap water/lemon juice) help mould grow more than on sugar water. ✓✓
OR
 Addition of tap water/lemon water/sugar water has no influence on the growth of mould on bread. ✓✓ (2)
- 2.1.2 Type of nutrient substance on bread ✓ (1)
- 2.1.3
 - Lemon juice is acidic. ✓
 - Acids hinder the growth of many common bacteria and fungi. ✓ (2)
- 2.1.4 To act as a control ✓ to compare ✓ results without the independent variable/variables (2)
- 2.1.5
 - Saprophytism ✓ exists between bread mould and bread.
 - Mould benefits by getting food from the bread. ✓
 - Bread is a non-living substance. ✓ (3)
- 2.2 2.2.1

3	Cell wall ✓	
5	Nucleoid/ chromosome/DNA ✓	
6	Plasmid ✓	(3)
- 2.2.2 Protects from drying out/desiccation/protects from antibiotics. ✓ (1)
- 2.2.3
 - Mutations occur spontaneously in bacteria ✓
 - Some mutations cause bacteria to be resistant to antibiotics ✓
 - By stopping to take antibiotics early in the course, one can be attacked by those that have acquired resistance. ✓ (3)

- 2.2.4
- Plasmid (6)/DNA from *E.coli* is removed.
 - Restriction enzymes are used to cut DNA. ✓
 - Human DNA with insulin is also cut and inserted into the *E.coli* plasmid/DNA. ✓
 - *E.coli* DNA is re-inserted into bacterial cell to reproduce human insulin. ✓
 - Human insulin is isolated and used to treat diabetics. ✓
- MARK FIRST THREE** (3 × 1) (3)
- 2.3 2.3.1 Platyhelminthes ✓ (1)
- 2.3.2 **Decomposition** ✓ (1)
- Earthworms✓/microorganisms feed on decaying organic compounds and break them down to nutrients✓ for plants (2)
- Pollination** ✓ (1)
- Insects like bees/butterflies✓/pollinate flowers and improve yield ✓ (2)
- Soil aeration** ✓ (1)
- Termites/ants/earthworms ✓ burrow into the soil and increase the water flow through the soil ✓ (2)
- (Any 2 × (1+2)) (6)
- 2.4 2.4.1 A Stamen✓/Androecium (1)
- 2.4.2
- The physical appearance of flowers/its coloured petals ✓
 - attracts pollinators✓ such as insects and birds for pollination
 - which ensures reproductive success ✓
 - seed dispersal mechanisms help to disperse seeds over a wide area✓ reducing competition amongst the plants. ✓
 - After fertilisation ovary develops into fruit✓ which can be eaten✓ (Any 5 × 1) (5)
- 2.5 2.5.1 A cladogram is a type of phylogenetic tree that shows the features which separate one group of organisms from the other. ✓ (1)
- 2.5.2 Bilateral symmetry ✓ (1)
- 2.5.3
- 1 Porifera ✓
 - 2 Cnidaria ✓
 - 3 Platyhelminthes ✓ (3)
- 2.5.4
- Impermeable to gases ✓ - special gaseous exchange organs are present. ✓
 - Cannot not stretch to allow growth ✓ - moulting/ecdysis/shedding of the exoskeleton occurs ✓ to allow growth
 - Soft exoskeleton after moulting doesn't offer protection - animal goes into hiding until exoskeleton becomes hard ✓ (Any 1 × 2) (2)
- [40]**

QUESTION 3

- 3.1 3.1.1 • There has been a considerable decrease ✓ in stored water in the country's dams between October 2014 and October 2015. ✓
OR
 • The Eastern Cape ✓ experienced a 2% increase ✓ in stored water. (Any 1 × 2) (2)
- 3.1.2 Western Cape ✓ (1)
- 3.1.3 A very dry summer season ✓ being followed by a drier than normal winter, ✓ which is usually when this region receives rain and its dams fill up. (2)
- 3.1.4 • People and their livelihoods are affected ✓ as they may have to relocate due to shortage of water. ✓
 • Natural balance/flow of the river is upset ✓ thereby reducing biodiversity. ✓
 • Large surface area ✓ increases the amount of water lost by evaporation. ✓ (Any 2 × 2) (4)
- 3.2 3.2.1 Alien plants are plants that do not naturally live/originate in a particular habitat/country. ✓
Indigenous plants are plants that are naturally found in a particular habitat/country. ✓ (2)
- 3.2.2 • Blocked waterways. ✓
 • Light is not able to enter. ✓
 • Photosynthesis cannot occur. ✓
 • Plants die and decompose. ✓
 • Bacteria deplete oxygen supply in water. ✓
 • Aquatic animals die. ✓ (Any 5 × 1) (5)
- 3.2.3 • Biological control is controlling alien plants through use of natural pests. ✓
 • It is a more environmentally friendly and safe ✓ way of controlling alien plants.
 • Chemical control is the use of chemicals ✓ to prevent the spread of alien plants.
 • It can kill desirable plant and animal species. ✓ (4)
- 3.3 3.3.1 Illegal hunting and killing of animals/illegal removal of plants ✓ (1)
- 3.3.2 • Meat serves as food/provides exotic dish/hides used for clothing ✓/as a sign of being rich.
 • Parts used for making muthi. ✓
 • Rhino horns are believed to cure cancer ✓/have aphrodisiac properties/increase sex drive. ✓
 • Illegal trade brings in lots of money. ✓ (Any 3 × 1) (3)

$$3.3.3 \quad \frac{1175 - 1004}{1004} \} \checkmark \times 100 \checkmark = 17,03\% \checkmark \quad (3)$$

- 3.3.4
- Stricter law enforcement ✓/Long jail term for offenders
 - Tracking devices inserted in rhino horns ✓
 - Treating the horn with a dye and insecticide ✓
 - Legal harvesting by authorities ✓
- (Any 3 × 1) (3)

3.4 3.4.1 Food security is having sufficient food regularly to ensure healthy living. ✓

AND

Food insecurity is the risk of not having sufficient food for some time in a year. ✓ (2)

3.4.2 Drought ✓/Two consecutive below average rainy seasons (1)

3.4.3 Malawi ✓ (1)

- 3.4.4
- Pesticide not only kills the intended prey ✓ but kills the predators as well. ✓
 - When effect of pesticide wears off, ✓ pest population increases rapidly. ✓
 - Some pesticide gets into soil ✓ and poison the plants which poison other trophic levels in the food chain. ✓
 - Concentration of pesticide increases as one moves up the food chain. ✓ This is known as Bioaccumulation. ✓
 - Pesticides washed into rivers kill fish and birds. ✓ Therefore less food is available for humans ✓/humans get poisoned by the poisonous fish they eat.
- (Any 3 × 2) (6)

[40]

TOTAL SECTION B: 80

SECTION C

QUESTION 4

Causes of Global Warming

- increased concentration of carbon dioxide in the atmosphere/carbon footprint increase ✓ due to:
 - burning fossil fuels for electricity, power vehicles and industrial processes ✓
 - combustion of carbon-rich fuels such as coal or plants (wood) releases carbon that was stored in them , as carbon dioxide ✓
 - deforestation ✓ which is the cutting down of trees and removing vegetation from the land. This ...
 - decreases the amount of carbon dioxide ✓ absorbed by plants during photosynthesis ✓
 - results in an increase in the amount of carbon dioxide in the atmosphere ✓
 - increase in methane gas in the atmosphere ✓ due to
 - decay of organic matter in waterlogged soils and landfills ✓ and increased number of livestock/human population
- (MAX 6)**

Effects of Global Warming

- Increased temperatures may lead to:
- more evaporation of water ✓, increases precipitation and flooding ✓
- rising sea levels caused by melting ice ✓ and thermal expansion also increase flooding ✓
- increased wildfires ✓ increase chances of soil erosion and desertification ✓
- increased loss of biodiversity ✓ as species cannot cope with very high temperature ✓
- increased droughts ✓ leading to food insecurity ✓ and desertification
- less water available to plants and animals ✓
- health hazards and diseases ✓

(MAX 8)**Solutions to Global Warming**

- Reduce the use of fossil fuels ✓
- Encourage the use renewable sources e.g. solar energy and wind power ✓
- Use nuclear energy ✓
- Reduce deforestation/desertification ✓
- Replant forests ✓
- Reduce global greenhouse emissions from various sources ✓
- Strict monitoring and law enforcements ✓
- Educate public about consequences/advocacy ✓
- Reward good practices ✓
- Use public transport ✓

(MAX 3)

Content (17)
Synthesis (3)
[20]

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Relevance (R)	Logical sequence (L)	Comprehensive (C)
Generally	All information provided is relevant to the topic.	Ideas are arranged in a logical/cause-effect sequence.	All aspects required by the essay have been sufficiently addressed.
In this essay	Only information relevant to causes and effects of global warming and solutions to global warming are given.	Information regarding causes and effects of global warming and solutions to global warming is given in a logical sequence.	At least FOUR correct points on each causes and effects of global warming and TWO correct points on solutions to global warming in the essay are obtained.
Mark	1	1	1

TOTAL SECTION C: 20
GRAND TOTAL: 150